4:Malkin E-5 (1953-1955) 1956 NU31 Seri NU31

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[Title page]

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SERI ETHNOBOTANY: A PRELIMINARY REPORT[1]

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121 In this paper I shall attempt to summarize briefly some of the possibilities inherent in ethnozoological studies. Ethnozoologies, published so far, have either stressed only the economic or medicinal uses of animals or have just included them as part and parcel of mythology and religion. The emphasis here, on the other hand, is primarily on the aboriginal knowledge of natural history and naturalistic concepts about animals. A comparison with the actual situation in nature will be frequently made in order to test the acuteness of the native observation.

This account is part of a wider comparative study in ethnozoology of several aboriginal groups. Additional field work has recently been completed among two other tribes, the Cora in Nayarit, Mexico, and the Sumu in northern Nicaragua.

Ethnozoological studies of such scope require much more extensive background in natural history than anthropologists or even zoologists today are likely to have. One has to deal with very diverse groups of animals and I have found my own knowledge of the subject repeatedly inadequate on many occasions. It is hoped that a study of this sort will attract individuals who will cover more satisfactorily the entire range of the animal kingdom.

Economic Uses

825 Almost all major classes of animals, with the exception of the insects,
262 are used for food. Only a very limited number of species serve other purposes
439 such as trade with the Mexicans. Among these are various species of large fishes, sea-turtles and a number of shells. None are used for the basic non-dietary products such as utensils, clothing, and other items of the material culture, for these are purchased ready-made in the local Mexican "tiendas" (small general store).

825 As a major source of income for their livelihood the Seris depend mainly
[439] upon a few commercially significant species of large fish and sea-turtles. Yet they do exploit a wide range of the animal environment as a source of additional food. Of the total number of species of animals[2] upon which information has been available, 45% were reported as economically exploited. The table below gives the breakdown of the major groups.

[p.73]

Class	Species Reported	Species Exploited	Percentages
Mammals	21	9	43
Birds	28	6	21
Reptiles and Amphibians	28	11	39
Fish	45	23	51
Molluscs	36	21	58
Crustaceans	10	2	20
Total:	160	72	45

These figures show clearly the dependence of the Seris on marine life for a major source of their diet. Today, pinta, boys, cubera and sardineros are their primary source of income with meat and sea-turtles ranking second in importance. Several species of clams, limpets and gastropods supplement this diet.

All other animals represent only incidental additions to the menu. During the last war, sharks and mantas were hunted extensively for their liver, then a source of vitamin D. But since the war, the demand for shark liver has declined and because of this, a considerable income for the Seris has been lost. Shark and manta fishing have been abandoned for these fish were taken only for the commercially profitable liver and not for their flesh.

Fishing and Hunting

Seri fishing techniques are simple. In the past they used double-pronged spears and for the larger fish, harpoons. Today the spears are employed chiefly in fishing while the harpoons are reserved exclusively for sea-turtles. Hook and line fishing was introduced after 1930, as Kroeber (1931) saw none during his visit to Kino in 1930, and it is now the standard method of fishing. An abortive and unsuccessful attempt was made several years ago with net fishing. Another change has occurred within the past fifty years. The old balsas have been replaced by flat-bottomed plank boats outfitted with five-horsepower motors or sails. These motors, incidentally, are leased from the Mexican fish traders because none of the Seris are rich enough to own one.

Bait is obtained by dynamiting schools of small fish in coastal waters or by collecting them at low tide in the tidal pools and from under rocks. Fishing usually begins at dawn and lasts until noon when, as a rule, all of the "pangas", as the boats are called, return to Desemboque. In stormy weather no fishing expeditions are made and when this occurs, starvation becomes a real menace. Harpooning of sea-turtles takes place far out in the Gulf. It is done only at night in exceptionally calm weather by the light of torches or Coleman lanterns.

Hunting as it is done today has changed from the time of McGee's visit in 1894-95. The bow and arrow has disappeared completely except for a crude and diminutive form used as a toy by small boys. Iron spears once used in shark and manta hunting are now carried primarily as a weapon against the numerous and much feared rattlesnakes. They are said to be used occasionally in the peccary hunt. Old .22s or 30/30 rifles are owned by several of the men, some of whom specialize in hunting.

Game pursuit is usually done on foot, mostly in the winter and very little in the summer. The intense heat of the desert in the summer makes hunting unattractive. The most frequent trophies are the Sonoran bighorn, peccary, cottontail and jack-rabbits. Sometimes, semi-wild burros, running loose on the adjacent extensive Mexican "rancherias", are poached for meat. The peccary is the only animal hunted with the aid of dogs. Large rodents are dispatched by sling-shot, stick, stone, or shot with a .22 caliber rifle. Birds, such as sea-gulls, ducks and pelicans, are clubbed, stoned or shot with a small caliber rifle.

While fishing and hunting are primarily men's occupations, the gathering of the terrestrial and marine animals is almost exclusively women's work. Rattlesnakes and other reptiles are often killed and brought to the encampments by the women from their morning trek into the desert after firewood and fruit. Small fish and marine invertebrates in the tidal pools are collected by women, aided by children of both sexes.

Preparation of meat is quite simple. It is either boiled in hot water with salt added as the only seasoning or else roasted whole, if small enough, over an open fire with or without a grill. The use of spices such as tomato sauce, chili, peppers, and the like, depend upon the tastes of the individuals and also upon the availability of money.

In individual competence as hunters or fishermen the men show a great deal of variability. Some excel in fishing while others do so in hunting. Hand in hand with this, goes the degree of knowledge of the local natural history and, as expected, the best fishermen lead in the knowledge of fishes while the best hunters possess the most extensive knowledge of terrestrial animals and insects. It has also been observed that boys were far ahead of adults in their knowledge of inconspicuous or otherwise commercially unimportant creatures such as insects, obscure marine invertebrates and small fishes. Interest in the commercially or otherwise economically important forms of animals unquestionably becomes overwhelming in adult life while much of the natural history lore learned in youth is forgotten.

Food Preferences and Taboos

A number of animals were reported as being a part of their diet in the past but which were not used at the present time. Several species of shells collected from kitchen middens along the coast were thus identified. In some instances it has been denied that a certain animal was used for food; yet, later when such a beast was brought to the camp, it would be added to the menu. Undoubtedly, some of the species were held in low esteem as food and the Seris preferred not to admit eating them.

Large fishes, especially pinta and baya, sea-turtles, and the very large chuckawalla lizard, which is brought back from rare expeditions to San Esteban Island, are the preferred cuisine. Cochi fish, also called puercos, are disdained. Large catches of these were frequently brought in from the sea, only to be unceremoniously dumped on the beach and left to the dogs and the vultures. But when other fish were scarce, the puercos were eaten. Pelicans, once an

important source of meat for the Seris, and sea-gulls are occasionally killed and likewise abandoned, except when famine threatens. The above examples most likely apply to other varieties of animals as well.

No specific food taboos were discovered in the course of field work except the unexplained reluctance to eat certain species. McGee (1898) reports a taboo on eating sea-lions but my informants asserted that these mammals were hunted in the past for both their flesh and hide. All of my informants denied that the Seris eat cougars, and this abhorrance has been confirmed by the Mexicans. Yet the Mexicans themselves do hunt and eat these big cats. McGee (1898:196, 202) again casually mentions cougars and jaguars as being hunted by by the Indians but gives no evidence for this. It should be mentioned that only a few Seris know what sort of an animal the jaguar is, and these know it only from hearsay as "huge animal inhabiting the mountains far in the interior". There are occasionally some migrant jaguars in Seri territory.

Pets

The Seris have only a limited variety of pets. Dogs are very numerous, each family keeping many of them. Although they maintain that the dogs are acquired in order to keep the coyotes away from the camps, there is nothing in their camps that a coyote would want to steal. There are a few cats and several species of wild desert doves which are often caged. Wild animals in captivity are, as a rule, those which accidentally come into the hands of the Indians. On one occasion a badger was kept tied to a house post for a couple of weeks and fed on fish heads, snakes, lizards and water until one night when it made its escape.

Of the insects, only the singing male Cicadas are captured by the roving Seri boys. These are tied to a long thread and having their fore-wings partly clipped, they are released into the air like kites. Local Mexicans also provide a similar kind of toy for their children.

Classification of Animals

Seri taxonomic notions of the animal world are vague and indistinct. No conscious classification exists and perhaps none should be expected of non-literate people. But there is a random association of animals based on the external similarities of form, habits and habitat. A clear distinction is made between plants and animals. Quite obscure animals, for example, the Echinoderms, Holothurians, Coelenterates or barnacles, are classed as animals and not as plants. It seems that voluntary movement is used here to distinguish the two categories. Thus, informants insisted that sea-anemones and jelly-fish are animals and not plants. One difficulty arises in the case of sessile barnacles. It is hard to account why those growing on the sea-turtles are classified as animals and are called "turtle fleas".

In the assemblage of major animals, the mammals form one group and birds and fish others. Since general similarity of form and not real structural affinities are the primary reason for these associations, the bats "are not birds, but are probably mammals because they have fur". Thus, sharks and

mantas are classed together and separate from the fishes while whales and dolphins represent another group; the latter two being considered as neither mammals nor fishes but as a category of their own. Yet, in many instances, especially in dealing with the smaller categories, natural affinities are placed together as is well shown in the case of many insects. For example, tiger beetles of the genera Tetracha and Cicindela are called by the same name, k*o-ps. Some of the Buprestid and Tenebrionid beetles also share a common name. In general, for the insects, similarity of shape, color, pilosity associated with the similarities of the habitat, behavior and particularly similarities of movement suggested natural affinities. This is very clear from the association of the two different kinds of tiger beetles in which the determining factors are the type of flight and running behavior plus the type of habitat in which both happen to live.

Sex Differentiation

All animals are said to have both the female and the male sexes, although it is not always possible to tell them apart. In almost half of the total number of species for which information has been obtained, the informants were unable to tell whether the sexes were different or alike in appearance. This proved to be particularly true in the case of insects. Of the remainder, in more than sixty cases, specific individual traits were given for the distinguishing of the two sexes. In most of these, the males are said to be larger than the females, which is actually the case. Another generalized trait of this sort was the supposedly darker coloration of the males. An analysis of these responses and a comparison with the actual sexual differences revealed that this was most likely a cultural pattern in operation and not a result of direct observation. This is certainly the reason why several pairs of different insects belonging not only to different genera but also to different orders were classified as being a male and female of the same kind. Thus two different Scarabeid beetles of the genera Ligyrus and Cyclocephala were considered the same, with Ligyrus being the larger and darker of the two, it was identified as the male. Informants also guessed that the male of the American Cockroach was darker and larger, not knowing that the female is quite different in appearance in being wingless. Confronted with several specimens of the grasshopper, Anconia integra, the informants suggested that the largest of them was a male. In another instance, the darkling beetle, Endrodes vendriccosus, was described as being the female of Arenivaga, a round roach, the smaller size of the beetle suggesting femaleness. But these examples do not exhaust the multitude of ways in which the Seris distinguish between the sexes.

For the land mammals, one of the standard characteristics distinguishing them was said to be the presence of "dos huevos", literally "two eggs", in the male. For the kangaroo rat it is the protruding penis which denotes the male, while for the bighorn it is the presence of larger horns. In the mule deer it is only the male that has horns and then only seasonally. An interesting attempt to generalize sexual differences in several species of lizards was made. Informants first searched for "ridges" on the ventral side of the femora, which supposedly denote the males. This, however, is a trait typical of separate genera of lizards and not of the sexes. But if here they have failed to uncover actual sexual differences, they have succeeded in the case of the gridiron-

tailed lizard, Callisaurus draconides insulitans, in which the males have blue abdomens, this fact being quickly pointed out by the informants. This association of more colorful pattern with the male was applied to several of the molluscs and to many of the fishes. In the fishes, another and standardized sexual distinction has been given; the males being longer and narrower and less bulky than the females. More specific characteristics have been given in sexing sharks and mantas. Here the males are said to have "two penises" near the vent. Indeed, they do have two claspers which are absent in the females. Interestingly, no sexual differences were given concerning birds. The informants simply could not tell the female from the male bird. This is not surprising at all for in most birds sexes cannot be distinguished without dissection.

Knowledge of Habitats

Habitat distinctions are sharply impressed upon the Seris. They are well aware of the fact that various marine animals and terrestrial animals have strong preferences in this respect. They know that some of the marine animals prefer deep waters while others prefer shallow water and that some will be found on sandy bottoms and others on rocky bottoms. They also know of similar preferences among the terrestrial animals; some being partial to the proximity of fresh water, others to sandy beaches, some to the mountains and others to the desert. This knowledge is frequently exact and often extends to quite small and inconspicuous creatures. Presented with Hydrophilus insularis, a large water beetle, the informants unhesitatingly gave its name as ?ax-hahkö, the prefix ?ax meaning water. They indicated also that it lives in fresh water. Yet this beetle is extremely rare in the locality, only one specimen having been seen and captured in the course of my field work. A giant tarantula-hunting wasp, Pepsis, was also said to live near water and its name has been given as ?aa kax . These tarantula killers indeed do often congregate near water. The tiger beetles were invariably associated with the "playas" and marine beaches, even when the informants were not told where they were captured and when they came from localities distant from Desemboque.

Likewise, the nesting grounds of egrets in the mangrove mud flats of the Estero Sargento, an estuary south of Desemboque, were correctly associated with the mud where these birds find an excellent feeding ground. In giving the distribution of the coastal animals, the informants often indicated their presence or absence at Porto Kino or Desemboque, stressing that the sandy sea bottom at Porto Kino and the rock sea bottom at Desemboque accounted for this fact. This is especially true of many fishes which prefer one or the other of these two habitats.

Seasonal Differences

The seasonal turnover in Sonora from winter to summer is very great; the summers being extremely hot and the winters quite chilly. This was particularly stressed by the informants in relation to reptiles and insects which are not much in evidence during the cold season. Most mammals, on the other hand, were indicated as equally numerous in both seasons. The fishes, accordingly, migrate a great deal. Most important commercial species were said to travel north in the spring and to return south in the late fall. Similar migrations were

ascribed to whales. Some of the birds are supposed to be migratory, but the direction of their migration is a mystery to the Seris. The swallows "pass in great numbers" but that is all that was known about them. The ducks winter on Isla Patos and then depart for the north in the spring without ever laying any eggs. Hence, their eggs were totally unknown to the informants. Egrets are said to remain in Estero Sargente for the winter.

Sometimes seasonal differences in the appearance of an animal were noted; for example, the loss of horns by the male mule deer during the winter. Seasonal differences are more sharply impressed upon the Seris than on either the Cora or the Sumu. This is not surprising because seasonal changes in Sonora are more contrasting than in either Nayarit or Nicaragua.

Age

The Seris find this feature of animal life the most difficult to ascertain. Hardly any responses were given that could be correlated with the actual length of life. Most replies were standardized according to the individual notions of the informant, such as "4 or 5 years", "about 6 months", and so on. In general, the larger the animal the greater the longevity attributed to it. In many cases it has been suggested that "perhaps the animal dies with the beginning of the cold season". This was frequently said especially in regard to reptiles. There is very little understanding of reptile hibernation through the winter.

Transformation and Immature Stages

No generalized idea of the transformation or metamorphosis of one kind of animal into another has been discovered, with the exception of two instances among the insects. Maggots are correctly associated with flies, but this is not surprising in an encampment where untold millions of them infest offal and other remains. It is also possible that this idea came to the Seris by way of the more sophisticated Mexicans. A hawk moth larva, found in great numbers on the jimson weed, was said to turn into a butterfly within 10 to 20 days if it rained, but if the rains failed, it would continue in its larval stage. These two unconnected cases represent the total knowledge of insect metamorphosis discovered in the course of my field work.

In other animals, the immature individuals are always described as being similar to the adults except for their smaller size. In addition to this, the young of several of the birds were supposed to have differently colored plumage.

Nocturnal and Diurnal Variation

As expected, there is very little knowledge of the activity of fishes, but there is a great deal of accurate knowledge of these phenomena for the mammals, many birds and reptiles. By way of illustration, rattlesnakes and most other snakes are reported as coming out at night and resting in the ground during the day, whereas the opposite is noted for the lizards. They are most active in the brilliant sunshine and go into hiding at night. For many mammals, decreased activity was noted during the day. Peccary, coyote, deer and cottontail were some of the mammals listed.

Food Habits

The food habits of all but a very few of the insects are totally unknown to the Indians but they do have accurate and detailed knowledge of the food habits of fish. This is probably due to the great economic importance of fish to the Seris. They also have very full data for the mammals, including bats, which are said to be insectivorous. The responses varied concerning lizards and often did not parallel the situation in nature. In some instances, the acuteness of the observation was remarkable. Thus, the Northern Crested lizard, Dipsosaurus dorsalis sonorensis, which occurs on the sands of Rancho San Francisco, inland from Desemboque, has been mentioned as climbing trees after fruit. Even more unusual, the leopard lizard, Crotaphytus wislizeni, was said to feed on other species of lizards. And indeed, it is one of the very few species of lizard in the region which habitually devours others of its own kind.

Mating Seasons, Eggs and Nesting

In most of these aspects of natural history the native information is quite deficient. In the case of birds, it is assumed that mating occurs in early spring, that the eggs are laid a month later, that in another month the young hatch out and about the third month they fly from the nest. This sequence seems to represent a conventionalized idea rather than a reflection of direct observation. Another difficult question for them to answer, with respect to the reptiles, was whether the young are born alive or whether they hatch from an egg. Only a few of the species are correctly described, among them the rattlesnakes. Sharks and mantas are said to give birth to live young.

Guesses as to the number of eggs varied from fairly accurate estimates for some of the birds to rough approximations ("many") for some of the reptiles and most of the fishes. The knowledge of bird nesting habits was fair. The informants had no difficulty in pointing out the particular localities where one or another species of bird nests nor in the identification of the nest by its shape and construction. This was especially true of the cormorants, egrets, sea-gulls and pelicans. All these are either marine or shore birds as will be noted.

Animals: Venomous and Otherwise Feared

In contrast to the Mexicans, the Seris fear relatively few animals and they are almost always those which can inflict a vicious or toxic bite or sting. The Mexicans, on the other hand, are afraid of a great many animals. European folklore plays a part in this as does unfamiliarity with the desert and the consequent fear of it.

The Seris fear most the rattlesnake, both the Western Diamondback and the Sidewinder. These snakes, they say, bite with their fangs but the venom is located in the rear of the body, about two inches in front of the anus. A plant called "huaco" (?) is used as a remedy both in the form of a drink and as a dressing for the wound. The Mexicans claim this remedy is effective. The coral snake is also considered to be venomous although the Seris believe that its bite is fatal only to Mexicans and not to themselves (!). Most of the

125 other snakes are also viewed as venomous but are claimed to be of mild disposition and do not bite people.

Among the lizards, curiously, the one feared most is not the highly poisonous Gila Monster, but the harmless little gekko, Coelonyx variegatus sonorensis, which lives in fallen and dried-up sagnaros. The informants could not even be induced to touch specimens killed in alcohol. It is believed 153 that this creature could kill humans either by contact or by allowing them to inhale its vapors which cause a fatal lung illness. This little lizard is reminiscent of the European salamander in some ways. The Mexicans call it 171 locally "salamanquesa", and attribute to it the same unpleasant traits which the Seris do. Since this little lizard does resemble the European salamander and the beliefs about it are quite similar to those in European folklore, it is possible that here is a case of a transfer of this folklore upon an animal of a different kind. These beliefs eventually perhaps diffused to the Seris.

A small desert night lizard, Xantusia vigilis, is also very much feared and is frequently confused with the gekko. It lives in an identical habitat. A toad, Bufo alvarius, is said to bite with its tongue and is supposed to be able to inject venom with it. Its blood and "milk" are also very toxic.

Several of the arthropods are believed to be dangerous. The Seris claim that the blood sucking cone-nosed beetle, Triatoma rubida, stings with its mouth parts and also causes an illness called syxhil i te kapap, which can be fatal to children. This bug actually is a vector of the Chagas disease and its repeated bites may cause a sensitization to them. But in this case it is impossible to tell which is the situation without a clinical analysis. Scorpions, which sting with their tails, are considered to be very dangerous. The Black Widow spider, which is very numerous in the locality, is also viewed as very toxic and is said to be sometimes fatal, although a few days' illness is all that its bite usually causes. The tarantula spider also bites but its venom is never fatal. The Sun spiders, Solifugida, are venomous but their venom supposedly kills horses but not people. All of these spiders and their relatives, according to the informants, sting with the rear end of their body in wasp-like fashion. No medicant is applied on the bite, nature being allowed to take its own course in the recovery.

Concerning other animals, the sting rays are much feared because of the venom in their thorns and their ability to inflict a nasty wound. The bats, according to some informants, can cause disintegration of the body by spitting on it and they also have venom in their tongues, although this belief was not shared by one of the more sophisticated informants.

Only a few animals are considered to be dangerous to eat owing to their toxicity. The toad is one and a little fish, Sphaeroides annulatus, is another. 162 Of this fish it is said that "one hundred years ago, a man ate one; he died", hence the avoidance. However, rattlesnakes are eaten with relish; only the head and the part of the body where venom is believed to be located being discarded.

171 The above discussion suggested some of the differences in the attitudes 125 toward animals between the Mexicans and the Seris. While the former fear many,

171 the latter are largely unconcerned with by far the greater majority of them.
825 If there is any magical importance attached to any of the species, it has not been discovered in the course of this field work and this fact has been corroborated by other recent observers.3

Summary

182 Extensive field work of this sort has many ramifications. One of the main
825 items investigated has been the acuteness of the native observation of animals. In the case of the Seris, this knowledge progressively increases both in volume and in accuracy with the increasing economic importance of the group. The mammals and large fish are the best known followed in order by birds, reptiles, smaller fish, insects and marine invertebrates. It is also obvious that local ecology, habits and anatomy of the various species of animals set definite limitations upon observation. Lack of understanding of the hibernation of reptiles through the winter is a case in point. Another example is in the Seris' inability to distinguish between the sexes of birds. Purely cultural factors are also potent as can be seen in the standardized responses to the questions about the age of animals and the development of birds. Seri knowledge of animals is remarkably free from mythology, although a number of animals are known to have had mythological significance in the past.

825 There is little fear of animals except of those which are actually dangerous.

An interesting fact emerges from the comparison of the particular aspects of the knowledge of natural history. Namely, that this knowledge is not always symmetrical in that some facets of natural history are far better known by the Seris than others. An excellent illustration is provided here in the complicated ways of sexing animals, in their extensive knowledge of the food habits of some of the animals and their ecological environment, and by their very limited ability to guess correctly the age of animals.

Not all of these differences can be accounted for in natural terms and it is suggested that the answer to this asymmetry lies, perhaps, in the cultural factors unaccounted for in this study. In spite of their dependence upon a relatively few economically important species of animals, the Seris do make use of much of their animal environment in their diet, as would be expected of a marginal people who still live today in a fishing and gathering economy.

FOOTNOTES

122 1. This field work was made possible by research grants from the Department
114 of Anthropology, University of Washington. Most of the work was done in Desemboque, Sonora, during the summer of 1953 with some additional work there in May 1955.

For much help in carrying out this field work I am indebted to my friend, Leo Sandoval, a school teacher in Desemboque.

4:Malkin E-5 (1953-1955) 1956 NU31 Seri NU31

2. In addition to these 160 species of animals, data has been obtained on more than 100 species of insects and their terrestrial allies, none of which are eaten.

3. Edward Spicer and William Smith, Jr., in verbal communication.

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